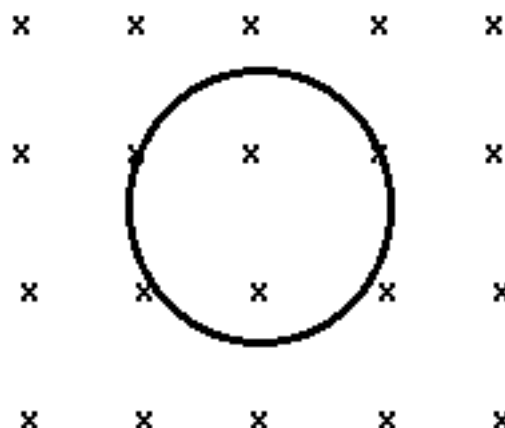
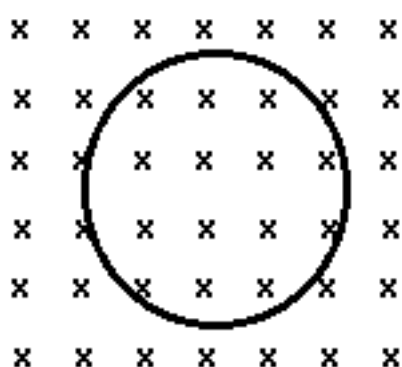


Example #6: A coil of 150 turns and an area of $2.0 \times 10^{-4} \text{ m}^2$ is placed in a 1.00 T magnetic field as shown in the diagram below to the left.



If this field changes to 0.45 T in 0.065 seconds, what is the average EMF induced in the coil and in what direction does the induced current flow?

$$\begin{aligned}
 N &= 150 \\
 A &= 2.0 \times 10^{-4} \text{ m}^2 \\
 \Delta B &= .45 - 1.00 \\
 &= -0.55 \text{ T}
 \end{aligned}
 \left. \vphantom{\begin{aligned} N \\ A \\ \Delta B \end{aligned}} \right\} \Delta \Phi = A \Delta B$$

$$\begin{aligned}
 &= (2.0 \times 10^{-4})(-0.55) \\
 &= -1.1 \times 10^{-4} \text{ Wb}
 \end{aligned}$$

$$t = .065 \text{ s}$$

$$\mathcal{E} = -N \frac{\Delta \Phi}{t} = -150 \left(\frac{-1.1 \times 10^{-4}}{.065} \right)$$

$$\boxed{\mathcal{E} = 0.25 \text{ V}}$$

→ a cw current will produce a field into the page to oppose the decrease into the page.